# EXPANDED METAL COMPANY *v.* BRADFORD.

CERTIORARI TO THE CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT.

# GENERAL FIREPROOFING COMPANY *v.* EXPANDED METAL COMPANY.

CERTIORARI TO THE CIRCUIT COURT OF APPEALS FOR THE SIXTH CIRCUIT.

Nos. 66, 606. Argued March 18, 19, 1909.—Decided June 1, 1909.

The writs of certiorari in these cases bring conflicting decisions of the Circuit Courts of Appeal to this court for review.

The patent involved in this case shows a method for expanding metal consisting of two operations, which when combined produce a new and useful result covered by the claim allowed; and this result, when read in connection with the specifications, shows substantial improvement in the art of making expanded metal work.

A new combination of elements, though old in themselves, which produces a new and useful result, entitles the inventor to the protection of a patent. *Loom Co.* v. *Higgins*, 105 U. S. 580.

While the mere function or effect of the operation of a machine cannot be the subject-matter of a patent, a method of doing a thing so clearly indicated that those skilled in the art can avail themselves of mechanism to carry it into operation can be the subject-matter of a patent. *Cochrane* v. *Deener*, 94 U. S. 780.

A process and an apparatus by which it is performed are distinct things. They may be found in one patent; they may be the subject of different patents. *Leeds & Catlin* v. *Victor Talking Machine Co.*, 213 U. S. 301.

An invention or discovery of a process or method involving mechanical operation and producing a new and useful result, such as expanding metal, may, and in this case does, entitle the inventor to a patent, and such a process is not limited to those showing chemical action or elemental changes. *Risdon Locomotive Works* v. *Medart*, 158 U. S. 68, distinguished.

S. Argument for the Expanded Metal Co.

case, *held*, that the Golding patent No. 547,242 for the process xpanding metal was a substantial improvement of the art in- ing mechanical operations and producing a new and useful result pendently of particular mechanisms for performing such process, is valid.

d. Rep. 564, reversed; 164 Fed. Rep. 849, affirmed.

facts, which involve the validity of certain letters of the United States, are stated in the opinion.

*Ernest Howard Hunter* for the Expanded Metal Co., oner in No. 66 and respondent in No. 606:

general question involved in these cases is that of the tability of processes which consist of mechanical steps erations only; the specific question is whether the im- ment in the art or method of making expanded sheet described and claimed in Golding's patent No. 527,242, October 9, 1894, is a new and useful invention, and otible as such of protection under the patent laws. "Ex- d sheet metal," or "expanded metal," as first sug- , as a possibility, and described in earlier patents was an idea of the possibility and desirability of such ma- as a commercial article, and the method of production, the earlier patents disclosed, was commercially imprac- e, and such metal was never practically or commercially ced according to it.

xpanded metal," as a commercial product, capable of the industrial arts, was originated by the complainant's ee, Golding, and one Durkee, under the process de- d in letters patent No. 320,242, dated June 16, 1885. It en first commercially and practically produced, became n as "expanded metal" and became extensively used ecognized as a new commercial article; but although ercially successful to some extent it was limited and re- d in its uses by the inherent defects of the process by it was produced. So great were these defects that some companies, both here and abroad, where Golding had

introduced his method, failed to achieve commercial success for about ten years until the improvement in the art described in the patent in suit. This improvement was a radical departure from the former method employed by the patentee. By it the deficiencies and limitations were entirely removed, and the character of the metal was so greatly improved that its adaptability and availability for commercial use were greatly extended. In fact this new process as described in the patent in suit, revolutionized the art of expanding sheet metal, and resulted in its being widely and generally adopted for industrial purposes throughout the world.

The patentee's invention consisted in a combination of certain operations in a certain relation to one another and to the material acted upon, by which a new result might be accomplished. The instrumentalities, which might be employed to carry out that invention commercially, were no part of the invention. What the patentee gave to the world was a new method of manipulating or cutting, bending and stretching sheet metal, to produce the thing known as expanded metal. That new method did not depend upon any particular instruments, it could be carried out by anyone by such instruments as might be found best adapted to the purpose. A dozen different machines might be created for carrying out the process; in fact, several different machines have been created. Old machines might be reorganized and made to do the work.

Instruments must be used to apply it to practice, but the invention must reside in the method and not in the instruments.

The patent laws require that a patentee shall explain his invention in a manner sufficiently clear to enable those skilled in the art to understand it. If the invention is a machine, then the machine must be described sufficiently to enable those skilled in the art to build and operate the machine; if the invention is a process, consisting, as a process must, merely in the performance of certain operations upon an article or substance, independently of the particular instruments employed,

then the patentee must describe the performance of those operations sufficiently to enable those skilled in the art to practice them, leaving to such persons the choice of the instruments used for the purpose.

The real defense is: that, even though Golding had invented a new and useful method which was not a machine or a manufacture or a composition of matter, it was not susceptible of protection under the patent laws, because it was a process or method which consisted of mechanical operations and did not involve chemical reactions or elemental changes, relying on *Risdon Iron & Locomotive Works* v. *Medart*, 158 U. S. 68, but that case is not in point. As to this see *Westinghouse* v. *Boyden Power Brake Co.*, 170 U. S. 537; *Carnegie Steel Co.* v. *Cambria Iron Co.*, 185 U. S. 403; *Simonds Rolling Machine Co.* v. *Hathorn Mfg. Co.*, 90 Fed. Rep. 201; *Melvin* v. *Thos. Potter Sons & Co.*, 91 Fed. Rep. 151; *Kahn* v. *Starrells*, 135 Fed. Rep. 532; *Thomas & Sons Co.* v. *Electric Porcelain Co.*, 111 Fed. Rep. 923; *Baker Lead Mfg. Co.* v. *National Lead Co.*, 135 Fed. Rep. 546; *Kirchberger* v. *American Acetylene Burner Co.*, 124 Fed. Rep. 764; *American Tube Works* v. *Bridgewater Iron Co.*, 132 Fed. Rep. 16; *Shepard* v. *Excelsior Furnace Co.*, 137 Fed. Rep. 399; *J. R. Williams Co.* v. *Miller DuBrul & Peters*, 107 Fed. Rep. 290; *Peters* v. *Union Biscuit Co.*, 120 Fed. Rep. 679; *In re Weston*, 94 O. G. 1786; *S. C.*, 17 App. D. C. 431; *In re Wagner*, 105 O. G. 1783; *S. C.*, 22 App. D. C. 267; *Ex parte Patterson*, 116 O. G. 2533.

The doctrine that processes involving mechanical operations, as distinguished from chemical reactions or elemental changes, are unpatentable, is foreign to the patent jurisprudence of other nations. *Boulton* v. *Bull*, Davies' Pat. Cases, 162; *King* v. *Wheeler*, 3 Barn. & Ald. 350; *Boulton & Watt* v. *Bull*, 2 H. Bl. 493; *Jones* v. *Pearce*, 1 Web. Pat. Cases, p. 123; *Russell* v. *Cowley*, 1 Web. Pat. Cases, 459; *Walton* v. *Potter*, 1 Web. Pat. Cases, 585; *Gibson* v. *Brand*, 1 Web. Pat. Cases, 627; *Reynolds* v. *Amos*, 3 Pat. Off. Rep. 215; *Dowling* v. *Billington*, 7 Pat. Off. Rep. 191; *Tubes, Limited*, v. *Perfecta Seamless Steel Co.*,

20 Pat. Off. Rep. 77; *Gammons* v. *Battersby*, 21 Pat. Off. Rep. 322.

The doctrine that processes are not patentable unless they involve chemical reactions and elemental changes is unjust and contrary to the spirit of the Constitution and the intent of the patent laws. 1 Robinson on Patents, § 167, p. 250; *Dowling* v. *Billington*, 7 Pat. Off. Rep. 191; *O'Rourke Engineering Construction Co.* v. *McMullen et al.*, 160 Fed. Rep. 933, 938.

If it be conceded—and it cannot be logically denied—that an exercise of the inventive faculties can be involved in the discovery of a combination of functions, acts or operations, by which a new and useful result is obtained, then to deny the patentability of such inventions is to establish a false standard of patentability, and to exclude a large class of meritorious inventors from the protection of the patent laws. Such a false standard is not recognized in other countries, it is not within the spirit of the Constitution or the meaning of the statutes, and we believe it was never the intent of the Supreme Court to create it.

*Mr. Frederick P. Fish* and *Mr. Thomas W. Bakewell*, with whom *Mr. E. Hayward Fairbanks* was on the brief, for respondents in No. 66 and petitioner in No. 606:

The subject of the patent in suit is the manufacture of expanded metal. This product, expanded metal, was old and the operations for making it were first disclosed and fully described in British specification, No. 2,125 of 1862, and other patents earlier than the one in suit.

In 1885 Golding & Durkee patented a machine (patent No. 320,241), which is still largely in use, for making this old product, expanded metal. Their mode of operation was such that they did not greatly strain the metal and they were consequently adapted to cut and expand thin sheets.

When, however, Golding came to treat thick sheets, he required cutters especially adapted for that purpose. He therefore devised a machine with knives arranged in a straight row

instead of a stepped row. In this machine the alternation in the position of the cuts was effected by shifting the cutters or the sheet itself between each stroke of the cutters. This alternate location of the cuts was old and the product of the machine was old. What is involved in the patent in suit is an effort to claim the function or mode of operation of this subsequently invented machine of Golding, a machine which performs an old process and produces an old product. In performing the old process the machine works according to its own peculiar manner or mode of operation; but almost all machines have distinctive modes of operation; and the rule of law that such modes of operation are not patentable, and that results are not patentable, but only new processes and new mechanisms and new articles, renders the patent in suit invalid.

The only reason for the success which has attended the device of the patent in suit is that the machine indicated therein was adapted to treat heavy metal, and in the modern art of concrete reinforcement heavy expanded metal has had a large use, and therefore that machines adapted to produce heavy metal have been largely used. This does not argue any novelty in method, but simply argues the adaptability of the machine to produce the heavy metal which is now demanded.

The case at bar involves no new principle of law, but only the rule of law that patents for methods or processes can only be granted for methods or processes which are new as methods or processes; that a new machine devised for the practice of an old method does not entitle one to a patent for a method of operation although it may have, as most machines have, a distinctive mode of operation.

The Expanded Metal Company admits that the operation of simultaneously cutting and bending metal so as to stretch the strand was old. It claims that what Golding discovered or invented was the act of repeating that old operation in such a way that the two operations would combine to produce a new result by reason of their combination.

And the record contains statements that amount to an ad-

mission that all the steps of the process recited in the claim of the patent were old, and that the only alleged novelty is in the application of the known and familiar step of stretching metal strands to the known process of expanding sheet metal.

The exigencies of the case have driven the complainant into the inconsistent position in the two suits now pending before this court. In the case at bar, where the defendant's machine has a guillotine-shape knife carrying a series of cutters arranged in a single straight line and therefore necessarily operating at each stroke in a straight line from end to end of the sheet, the complainant, in order to sustain its contention of novelty in the method, has found it possible, without at the same time differentiating its patent from the defendant's machine, to contend that a novel step of the method patented was the forming of the cuts in the sheet of metal in a straight line and then, in successive operations forming other parallel series of cuts in alternate positions. This complainant contends in No. 606.

In No. 66, the defendant's machine in this respect is substantially different from that of the defendant in No. 606. It does not make a single line of cuts extending from end to end of the sheet, but makes diagonal cuts arranged like the cuts produced by the machine of the prior patent of Golding & Durkee. The interpretation which the complainant puts upon the claim of the patent in the case at bar is rendered impossible and untenable by the charge of infringement which it makes in the *Bradford case*. In these two suits the complainant has assumed different and contradictory definitions of the patented invention.

The alleged invention of the patent in suit is not patentable as a method. The subject-matter of the claim being a method, the patentee must be an original and first inventor of a method. *Tilghman* v. *Proctor*, 102 U. S. 707, 728.

Keeping in mind the distinction, both in fact and in law, between method and apparatus, there are three classes of decisions in "method" cases.

Those in which the patentee is shown to be the first and original inventor of the entire method, as in *O'Reilly* v. *Morse*, 15 How. 62; *Eames* v. *Andrews*, 122 U. S. 40 (the *Driven Well case*); *The Telephone Cases*, 126 U. S. 1.

Those in which the patentee is the inventor of some new and essential part of a method otherwise old, as in *Mowry* v. *Whitney*, 14 Wall. 630; *Cochrane* v. *Deener*, 94 U. S. 780; *New Process Fermentation Co.* v. *Maus*, 122 U. S. 413.

In cases coming fairly within either of these two classes, the patents have generally been sustained—and properly so.

In the third class are included those patents which include no substantial novelty of operation, or those in which every essential element of method is already well known in the same art.

In such cases, the courts have uniformly held a method claim to be void—and this for the reason that in respect of method, the patentee has invented nothing. In fact, nothing remains for him to invent except a machine by which to work the method.

In a method claim, in order that it may be held patentable, the patentee must have incorporated some novelty of operation which was previously unknown in the art to which his invention belongs, and this must be something different from the mere mode of operation of apparatus with which an old method is put into practice. *Corning* v. *Burden*, 15 How. 252; *Burr* v. *Duryee*, 1 Wall. 570; *Fuller* v. *Yentzer*, 94 U. S. 288; *Knapp* v. *Morss*, 150 U. S. 227; *Wing* v. *Anthony*, 106 U. S. 142, 146; *Risdon Locomotive Works* v. *Medart*, 158 U. S. 68; *Cochrane* v. *Deener*, 94 U. S. 780; *Busch* v. *Jones*, 184 U. S. 589; *McKay* v. *Jackman*, 12 Fed. Rep. 615; *Brainard* v. *Cramme*, 12 Fed. Rep. 621; *Hatch* v. *Moffit*, 15 Fed. Rep. 253.

Mr. Justice Day delivered the opinion of the court.

These cases involve opposing decisions as to the validity of letters patent of the United States No. 527,242, dated Octo-

ber 9, 1894, granted to John F. Golding for an alleged improvement in the method of making expanded sheet metal. In case No. 66, here on writ of certiorari to the Circuit Court of Appeals for the Third Circuit, a decree of the Circuit Court of the United States for the Eastern District of Pennsylvania, sustaining the patent, was reversed, and the patent held invalid. The opinion of the Circuit Judge sustaining the patent is found in 136 Fed. Rep. 870. The case in the Court of Appeals is found in 146 Fed. Rep. 984. After the decree in the Circuit Court of Appeals for the Third Circuit, the Expanded Metal Company having filed a bill against the General Fireproofing Company in the Circuit Court of the United States for the Northern District of Ohio, the case was heard and the patent held invalid on the authority of the case in the Circuit Court of Appeals for the Third Circuit. 157 Fed. Rep. 564. The Circuit Court of Appeals for the Sixth Circuit reversed the United States Circuit Court for the Northern District of Ohio, and held Golding's patent valid and infringed. 164 Fed. Rep. 849. These writs of certiorari bring these conflicting decisions of the Courts of Appeal here for review.

The patent in controversy relates to what is known as expanded sheet metal. Expanded metal may be generally described as metal openwork, held together by uncut portions of the metal, and constructed by making cuts or slashes in metal and then opening them so as to form a series of meshes or latticework. In its simplest form sheet metal may be expanded by making a series of cuts or slits in the metal in such relation to each other as to break joints, so that the metal, when opened or stretched, will present an open mesh appearance. It may be likened to the familiar woven wire openwork construction, except that the metal is held together by uncut portions thereof, uniting the strands, and the whole forms a solid piece.

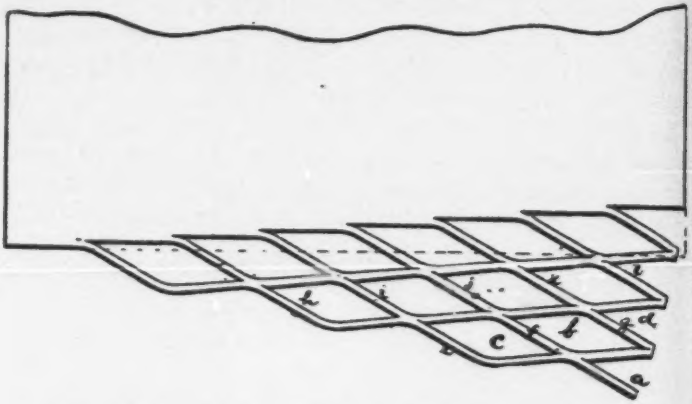
In the earlier patents different methods are shown for cutting the metal, which cuts were afterwards opened by a separate operation of pulling or stretching. These crude methods

are shown in the earlier American and English patents which appear in the record. While nothing more than such methods was accomplished in the art there was little general or commercial use for expanded metal.

It was apparent that if a method could be devised by which the metal could be simultaneously cut and expanded, such method would be a distinct advance in the art, and this record discloses that the desirable result of simultaneously performing these operations was accomplished in the Golding and Durkee patent No. 320,242. In that patent the operation was performed by means of knives arranged in a step order, the sheet to be fed obliquely. The inventors describe the Golding and Durkee method as follows:

"The process consists in the employment of a flat piece of metal of any desired size, and beginning at one side and corner and making an incision within the side of the metal, thus forming a strand which is simultaneously pressed away from the plane of the metal in a direction at or near a right angle, the position the strand assumes depending upon the distance it is moved from the plane of the metal. *a* in the drawing shows the first cut made. The next step in this process is to make additional incisions, as is shown at *c*, *b*, and *d*, further within the plate of metal, and leaving uncut sections at the ends of the cuts, and simultaneously with the cutting the strands are pressed away from the plane of the metal at the angle and to the desired position, as above described. Thus each row of meshes is simultaneously cut and formed from a blank piece of metal without buckling or crimping the blank. In the act of cutting and forming the meshes, the finished article is contracted in a line with the cuts or incisions, and consequently it is shorter in this direction than the piece from which it was cut, but it is greatly lengthened in a line at an angle to the plane of the original sheet, plate or blank."

The result was to produce expanded metal, as shown in this figure:




With this patent as the advanced state of the art, Golding set about making further improvements and the result was the patent in suit. The specifications of the patent in suit state:

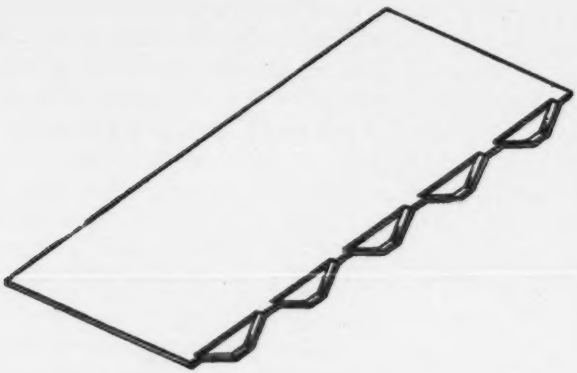
"In the manufacture of what is now generally known as expanded sheet metal, it has been customary to first cut the slits in the sheet metal at short distances apart, and to open the metal at the cuts thus formed by bending the severed portions or strands in a direction at right angles substantially to the plane of the sheet. It has also been made by simultaneously cutting and opening the metal by means of cutters set off or stepped relatively so as to make the slashes or cuts in different lines in the manner set forth in patents No. 381,230 or No. 381,231, of April 17, 1888. In both of these methods the product is somewhat shorter and materially wider than the original sheet, but practically no stretching or elongation of the metal forming the strands is caused.

"In my present invention I seek to avail myself of the ability of the metal to stretch or distend as well as of its ability to bend under strain or pressure, and the invention consists in the improved method of making expanded metal, viz., by simultaneously cutting and opening or expanding the metal at the cuts by stretching the severed portions."

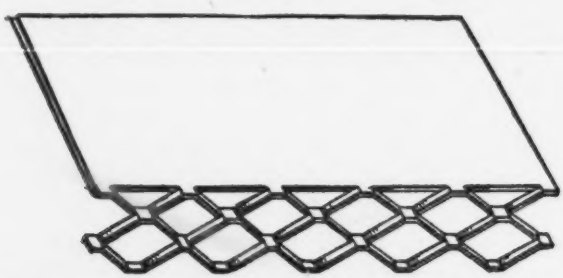
In the method further described in the specifications the expanded metal is shown to be made by the use of knives making a series of slits in a straight line at equal distances apart across the sheet and at the same time carrying downward the severed portions of the metal. And this operation is performed by bending the severed portion at a time when its ends are securely attached to the main sheet, thereby expanding the sheet without materially shortening it. The sheet is then fed forward, and the slitting and stretching operation is repeated in such a manner that the slits are in every case made back of the portion unsevered by the preceding operation, or, in other words, as the specification states, the slits and unsevered portions alternate in position in each successive operation, the bends given to the severed portions or strands being in direction at right angles to the plane of the sheet, there is no contraction in the length of the metal, and the expansion is obtained by the stretching, distension, or elongation of the severed strand. This patent contains the single claim, which is as follows:

"The herein described method of making open or reticulated metal work, which consists in simultaneously slitting and bending portions of a plate or sheet of metal in such manner as to stretch or elongate the bars connecting the slit portions and body of the sheet or plate, and then similarly slitting and bending in places alternate to the first-mentioned portions, thus producing the finished expanded sheet metal of the same length as that of the original sheet or plate, substantially as described."

It is thus apparent that the method covered by the claim of the patent is accomplished by the two operations indicated and performed in the manner pointed out in the specifications. The first operation of cutting, bending and stretching the strands simultaneously produces a series of stretched loops or half diamonds. Thus:



This series of half diamonds is then supplemented by the second operation, which consists in making a second series of cuts and expansions for stretching the strands back of and opposite the parts of the metal left uncut by the first operation. The result is that the series of one-half diamonds is converted into the series of full diamonds and because of the manner in which the stretching is done, while the ends of the strands are still firmly attached to the sheet, there is no material shortening of the length of the sheet. Thus:



What has Golding accomplished by this alleged improvement? These records leave no doubt that there are substantial advantages in the method of the patent in suit. As the sheet is not shortened, the completed product is regular

in form and ready for many uses to which the shortened sheet of the old method could not be put. The metal worked upon can be much heavier than that which could be successfully manipulated by the old process. The meshes are formed in a uniform and regular way, so that a line drawn through their intersections in one direction is at right angles with a line drawn through their intersections in the other direction. There is no irregularity in the width of the strands. Put to the test of actual use, this record discloses that while the method of the Golding and Durkee patent is still in use in some places in this country, the method disclosed in the patent in controversy is largely in use in the United States, Great Britain and Continental Europe; that it has greatly increased the use of expanded metal in this country, and opened new fields for use where sheets of a regular shape can be used to a greater advantage than they could be when made under the old process.

The learned Circuit Court of Appeals for the Third Circuit seems to have regarded the invention as consisting merely of the improvement of the process in the manufacture of expanded metal by stretching certain portions of the metal when the slit is cut and the mesh is opened. A broad claim of that character was made in the Patent Office, and the file wrapper and contents show that it was disallowed by the examiner. The claim in its present form, framed by the examiner as sufficient to cover the real invention of the patent, was accepted by the applicant, and is now the claim of the patent.

If all that Golding did was to show a method of simultaneously cutting and stretching the metal, the examiner was doubtless right in holding it to have been anticipated by former inventions, notably the patent to Ohl, No. 475,700, and in a degree in the previous patents to Golding and to Golding and Durkee.

But the patent in suit, embraced in the claim allowed, shows more than a mere method of making open meshes by simultaneously cutting and stretching the metal. It shows a method by which the metal is first cut and stretched in the

manner indicated to make the half diamond, and then a second operation, coördinating with the first and completing the mesh by the manner in which it is performed in connection with the first. It is the result of the two operations combined which produces the new and useful result covered by the claim allowed in the Patent Office, and, which, when read in connection with the specifications, shows substantial improvement in the art of making expanded metal work.

But it is said that the patent in suit discloses no means of practically operating the method shown, and therefore, as said by the learned judge in the Third Circuit, "it is but the expression of a happy thought," but the requirement of the patent law, in order to make a method or process patentable, is that the patent shall indicate to those skilled in the art the adaptation of means to put it into practice.

We think this record amply discloses, while no complete mechanism is pointed out in the specifications, enough to indicate to those skilled in such matters a mechanism whereby the method of the patent can be put into operation. As said by Judge Severens, delivering the opinion of the court in No. 606, in the Circuit Court of Appeals for the Sixth Circuit:

"But here the inventor has gone on to point out that the slitting and bending is to be done by a stationary cutter under the sheet, and upper cutters to coöperate in shearing the slit. These upper cutters are so constructed as to bend down the strand to the proper distance. It is not stated just what the form shall be, but only ordinary skill in mechanics would suggest that the outer side of the cutter might be bevelled or a shoulder might be formed thereon to carry down the strand when severed.

"Mechanism for the shifting of the sheet and of the knives was already in use in machines for expanding metal, and, indeed, was common in the mechanical arts. Moreover, experts have here testified that these devices could be arranged by any skillful mechanic, and we have no reason to doubt it."

Golding testifies that he at first executed his process by

hand. Other witnesses, skilled in the art, say that they could do likewise from the information found in the patent.

The important thing in this patent is a method of procedure, not the particular means by whch the method shall be practised. Golding's machine patent was not applied for for more than a year and a half after the issue of the patent in suit.

It is suggested that Golding's improvement, while a step forward, is nevertheless only such as a mechanic skilled in the art, with the previous inventions before him, would readily take; and that the invention is devoid of patentable novelty. It is often difficult to determine whether a given improvement is a mere mechanical advance, or the result of the exercise of the creative faculty amounting to a meritorious invention. The fact that the invention seems simple after it is made does not determine the question; if this were the rule many of the most beneficial patents would be stricken down. It may be safely said that if those skilled in the mechanical arts are working in a given field and have failed after repeated efforts to discover a certain new and useful improvement, that he who first makes the discovery has done more than make the obvious improvement which would suggest itself to a mechanic skilled in the art, and is entitled to protection as an inventor. There is nothing in the prior art that suggests the combined operation of the Golding patent in suit. It is perfectly well settled that a new combination of elements, old in themselves, but which produce a new and useful result, entitles the inventor to the protection of a patent. *Loom Company* v. *Higgins*, 105 U. S. 580–591.

To our minds, Golding's method shows that degree of ingenuity and usefulness which raises it above an improvement obvious to a mechanic skilled in the art, and entitles it to the merit of invention. Others working in the same field had not developed it, and the prior art does not suggest the combination of operations which is the merit of Golding's invention.

It is lastly contended, and this is perhaps the most important question in the case, that in view of the former declara-

tions and opinions of this court, what is termed a process patent relates only to such as are produced by chemical action, or by the operation or application of some similar elemental action, and that such processes do not include methods or means which are affected by mere mechanical combinations, and a part of the language used in *Corning* v. *Burden*, 15 How. 252, and *Risdon Locomotive Works* v. *Medart*, 158 U. S. 68, is seized upon in support of this contention. We have no disposition to question the decision in those cases.

An examination of the extent of the right to process patents requires consideration of the object and purpose of the Congress in exercising the constitutional power to protect for a limited period meritorious inventions or discoveries. Section 4886 of the Revised Statutes provides:

"Any person who has invented or discovered any new and useful art, machine, manufacture, or composition of matter, or any new and useful improvement thereof . . . may obtain a patent therefor."

This is the statute which secures to inventors the right of protection, and it is not the province of the courts to so limit the statute as to deprive meritorious inventors of its benefits. The word "process" is not used in the statute. The inventor of a new and useful art is distinctly entitled to the benefit of the statute as well as he who invents a machine, manufacture, or composition of matter. The word "process" has been brought into the decisions because it is supposedly an equivalent form of expression or included in the statutory designation of a new and useful art.

What then is the statutory right to a patent for a "process" when the term is properly considered? Curtis, in his work on the Law of Patents, says:

"A process may be altogether new, whether the machinery by which it is carried on be new or old. A new process may be invented or discovered, which may require the use of a newly-invented machine. In such case, if both the process and the machine were invented by the same person, he could take sepa-

rate patents for them. A new process may be carried on by the use of an old machine, in a mode in which it was never used before. . . . In such a case, the patentability of the process in no degree depends upon the characteristic principle of the machine, although machinery is essential to the process, and although a particular machine may be required." Curtis, 4th ed. § 14.

In Robinson on Patents, vol. 1, § 167, it is said:

"While an art cannot be practiced except by means of physical agents, through which the force is brought in contact with or directed toward its object, the existence of the art is not dependent on any of the special means employed. It is a legal, practical invention in itself. Its essence remains unchanged, whatever variation takes place in its instruments as long as the acts of which it is composed are properly performed."

And Walker on Patents, 4th ed. § 3, states that valid process patents may be granted for "operations which consist entirely of mechanical transactions, but which may be performed by hand or by any of several different mechanisms or machines."

It is undoubtedly true, and all the cases agree, that the mere function or effect of the operation of a machine cannot be the subject-matter of a lawful patent. But it does not follow that a method of doing a thing, so clearly indicated that those skilled in the art can avail themselves of mechanism to carry it into operation, is not the subject-matter of a valid patent. The contrary has been declared in decisions of this court. A leading case is *Cochrane* v. *Deener*, 94 U. S. 780, in which this court sustained a process patent involving mechanical operations, and in which the subject was discussed by Mr. Justice Bradley, speaking for the court. On page 787 that learned justice said:

"That a process may be patentable, irrespective of the particular form of the instrumentalities used, cannot be disputed. . . . Either may be pointed out; but if the patent is not confined to that particular tool or machine, the use of the others would be an infringement, the general process being the

same. A process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject matter to be transformed and reduced to a different state or thing. If new and useful, it is just as patentable as is a piece of machinery. In the language of the patent law, it is an art. The machinery pointed out as suitable to perform the process may or may not be new or patentable; whilst the process itself may be altogether new, and produce an entirely new result. The process requires that certain things should be done with certain substances, and in a certain order; but the tools to be used in doing this may be of secondary consequence."

This clear and succinct statement of the rule was recognized and applied (Mr. Justice Bradley again speaking for the court) in the case of *Tilghman* v. *Proctor*, 102 U. S. 707. In the course of the opinion the learned justice tersely says:

"A machine is a thing. A process is an act, or a mode of acting. The one is visible to the eye—an object of perpetual observation. The other is a conception of the mind, seen only by its effects when being executed or performed. Either may be the means of producing a useful result."

That this court did not intend to limit process patents to those showing chemical action or similar elemental changes is shown by subsequent cases in this court.

In *Westinghouse* v. *Boyden Company*, 170 U. S. 537, the opinion was written by the same eminent justice who wrote the opinion in *Risdon Locomotive Works* v. *Medart*, 158 U. S. *supra*, and, delivering the opinion of the court, he said (p. 557):

"These cases [158 U. S. 68, and 103 U. S. 461] assume, although they do not expressly decide, that a process to be patentable must involve a chemical or other similar elemental action, and it may be still regarded as an open question whether the patentability of processes extends beyond this class of inventions."

And added these significant words:

"Where the process is simply the function or operative effect

of a machine, the above cases are conclusive against its patentability; but where it is one which, though ordinarily and most successfully performed by machinery, may also be performed by simple manipulation, such, for instance, as the folding of paper in a peculiar way for the manufacture of paper bags, or a new method of weaving a hammock, there are cases to the effect that such a process is patentable, though none of the powers of nature be invoked to aid in producing the result. *Eastern Paper Bag Co.* v. *Standard Paper Bag Co.*, 30 Fed. Rep. 63; *Union Paper Bag Machine Co.* v. *Waterbury*, 39 Fed. Rep. 389; *Travers* v. *Am. Cordage Co.*, 64 Fed. Rep. 771. This case, however, does not call for an expression of our opinion upon this point, nor even upon the question whether the function of admitting air directly from the train pipe to the brake cylinder be patentable or not, since there is no claim made for an independent process in this patent, and the whole theory of the specification and claims is based upon the novelty of the mechanism."

And the same learned justice wrote the opinion of the court in *Carnegie Steel Co.* v. *Cambria Iron Co.*, 185 U. S. 403, and sustained a process patent. If by any construction that process could be said to involve a "chemical or other similar elemental action," no stress was laid upon that fact. This court, speaking through Mr. Chief Justice Waite, sustained a patent in the *Bell Telephone Cases*, 126 U. S. 1, for a method of transmitting electrical undulations similar in form to the vibrations of the air accompanying vocal sounds, and at the same time the patent for the apparatus by which the method was operated was sustained.

In *Leeds & Catlin* v. *Victor Talking Machine Company*, decided at this term, 213 U. S. 301, 318, this court said: "A process and an apparatus by which it is performed are distinct things. They may be found in one patent; they may be made the subject of different patents."

We therefore reach the conclusion that an invention or discovery of a process or method involving mechanical operations,

and producing a new and useful result, may be within the protection of the Federal statute, and entitle the inventor to a patent for his discovery.

We are of opinion that Golding's method was a substantial improvement of this character, independently of particular mechanisms for performing it, and the patent in suit is valid as exhibiting a process of a new and useful kind.

As to the infringement, little or no question was made in case No. 606. In case No. 66 the Circuit Court held that there was some evidence of infringement, enough at least to warrant the decree sustaining the patent and awarding an accounting. With this conclusion we agree. It follows that the decree of the Circuit Court of Appeals for the Third Circuit (No. 66) should be reversed and that of the Circuit Court of Appeals for the Sixth Circuit (No. 606) should be affirmed, and the cases remanded to the Circuit Courts of the United States for the Eastern District of Pennsylvania and the Northern District of Ohio, respectively, for further proceedings consistent with this opinion.

*Decrees accordingly.*